

JTEG

Rapidly delivering war-winning capability

July 2003

ALCs' Top Five Unfunded Depot Requirements & Path to Satisfying Them



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Background

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- During the 25 Feb 2002 AFMC ATC, an action item was generated for the Air Logistics Centers to provide their top five unfunded depot requirements to AFMC/CV via ASC/CC.
- Centers provided their requirements
- HQ AFMC, AFRL, and ASC/AAA working to resolve



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Our Path to Satisfying

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- Representatives from AFRL, ASC/AAA, and AFMC/LG/EN visited the three ALC in Apr 03
 - Purpose of review was to fully understand the depot top five unfunded requirements
- Aging Aircraft office and AFRL scheduled to review and categorize top five in May 03. Requirement categories are:
 - No longer valid
 - In work
 - Solved through: Commercial-Off-The-Shelf (COTS) or System Program Director
 - Transition
 - Science and Technology (S&T)
- Next actions:
 - Estimate costs for S&T and Transition requirements
 - Validate list with HQ AFMC
 - Work POM submission with AFMC starting Jun 03



Initial Categorization of Top Five

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- **OO-ALC**
 - 1 in work at Air Armament Center
 - 1 in work at Aging Aircraft office
 - 1 in work at OO-ALC, could use some transition funding or if requirement expands, could use S&T
 - 1 either COTS or Transition
 - 1 either Transition or S&T
- **OC-ALC**
 - 1 S&T
 - 2 either COTS or Transition
 - 2 either Transition or S&T
- **WR-ALC**
 - 1 no longer a valid requirement
 - 2 either Transition or S&T
 - 2 either COTS, Transition or S&T



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Satisfying Depot Requirements

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OO-ALC - Top 5 Technology Needs	COTS/SPD	Transition	S&T
Advanced Non-Destructive Evaluation - Laser Ultrasound Inspection of Composites		X MANTECH project if only consolidation required	X S&T if integrated tool is required
Advanced Composite Replacement for Space Command, Control Communication Shelters	X In work at Center	X Transition funding could assist	X S&T if EMI is embedded in composite
Insensitive Munitions (IM) explosives as alternative for TNT in general purpose bombs	In work at Air Armament Center		
Process to Convert Present Simulators to State-of-the-Art Systems (Requirement to rehost existing software)	X CRSIP or CTMA may be working similar project	X If not CRSIP or CTMA then transition	
Develop High Speed 1553 Data Bus for Aircraft LRU Data Exchange		X Expanded 1553 data bus project funded in FY03	

Methods of Transition:

- 1 - COTS/SPD – ALC/SPD Funds
- 2 - Transition of available technology - No S&T
- 3 - S&T - Potential ATD Candidate (Transition Plan by Fall 03 ATC)



Satisfying Depot Requirements

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OC-ALC - Top 5 Technology Needs	COTS/SPD	Transition	S&T
Structural Component Smart Coatings - Engines			X
Enabling Technologies for Migration of Shop Floor IT (Solution depends on extent of the technologies requested. Could be in any category)	X	X	X
Radome Damage & Repair System		X Integrate existing tools	X Develop new, integrated, tool
Rapid Fuel Tank Leak Detection (More important to fix than to detect)		X	X
Generic Circuit Card Assembly (Solves parts obsolescence and sustainment issues)	X	X	

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Satisfying Depot Requirements

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WR-ALC - Top 5 Technology Needs	COTS/SPD	Transition	S&T
Continued Advanced/Improvements of NDI/Quantification Technologies <ul style="list-style-type: none"> - Automatically detect or significantly reduce inspection times for first and second layer hole cracks on F-15, C-130, and C-141 aircraft - Detect fluid and categorize type of fluid in honeycomb sandwich structures (In work for F-15, WR-ALC assessing requirement for C-5) - Determine residual stress states using empirical data in primary and secondary large, high strength aluminum aircraft structures - Develop a device to detect and quantify corrosion for field-level inspections 		X In work, Autoscan project X X Tool available	X In situ tool would require S&T
Continued Advancement/Improvement of Structural Repair/Replacement Technologies <ul style="list-style-type: none"> - Develop repair methodology for bonded composite doublers and other repair options for C-141 and C-130 fuselage with emphasis on the difficult areas with respect to construction, shape, loads, and ease of installation 		X Transition to Aircraft Battle Damage Repair	

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Satisfying Depot Requirements

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WR-ALC - Top 5 Technology Needs	COTS/SPD	Transition	S&T
Continued Advancement/Improvement of Structural Repair/Replacement Technologies (Con'td) <ul style="list-style-type: none"> - Bonded Composite Repair – Repair Patch Optimization <ul style="list-style-type: none"> -- Test precured, cocured, and cold bond paste adhesive bonded repairs to compare fatigue and static strength -- Test high aspect ratio doubles -- Test actual integrally milled wing panels to study fail safe possibilities - Redesign C-5 Honeycomb Floor Panels - Develop an intelligent, integrated manufacturing cell intended to produce detailed machined aircraft structural members directly from digital engineering data through near net-shape metalworking processes <ul style="list-style-type: none"> - Same as (4) above, but On-Demand Near Net-Shape Manufacturing, e.g. Laser Additive Manufacturing and Metal Matrix Cast Composites 		X	X
		AFRL working project Matrix	
		X Material substitution	X
			X

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Satisfying Depot Requirements

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WR-ALC - Top 5 Technology Needs	COTS/SPD	Transition	S&T
Continued Advancement/Improvement of Subsystem Technologies <ul style="list-style-type: none"> - Transition the Air Force Wiring Integrity Program products to the F-15 field/depot environment - Solve the Automated Test Systems (ATS) parts obsolescence challenge thru four phased program: 1) Develop a ATS database, 2) Analyze database to identify issues, 3) Develop methodology and architecture for solving problems, and 4) Improve supportability - Secure collaboration in an integrated digital environment (OO and OC have the same requirement) 	X	X Aging Aircraft project X X	X ATD
Continued Advancement/Improvement of Corrosion/Corrosion Prevention Technologies <ul style="list-style-type: none"> - Develop alternative coating system to replace current polyurethane system for vehicles - Develop field level device to detect and quantify aircraft corrosion 	No longer a valid requirement		

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WR-ALC - Top 5 Technology Needs

Continued Advancement/Improvement of Analytical/Predictive Tool

- Rehost ECOMISE to Windows NT or Windows 2000 and JTIDs/MIDs to object orientated HOL for PC use
- Develop a Windows/NT based multiple weapon systems structural and damage tolerance analysis and database
 - Understand crack growth in the short crack regime and effects on primary load path failure on fail safe
 - Capability to assess the effects of corrosion on fatigue life
 - Understand stress intensities at cracks under composite doublers
 - Access to contractor or SPD maintained inspection and repair database repositories
- Integrate Probabilistic Risk Assessment Tool (Update PROF)
- Develop damped composite patches for sonic fatigue avoidance
 - Identify sonic fatigue damage cases
 - Combine environments and loading sources including temperature
 - Design and analyze methods for damped composite patches

COTS/SPD

Transition

S&T

X

X

X
X
X

X

WR-ALC validating requirement

X

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Summary

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- Visits to the centers very profitable
- Working to finalize requirement categories
- Working on plan to POM for highest priority requirements